

REMARKS

In the office action, all pending claims are rejected as being anticipated by U.S. Patent No. 6,664,788 to Hornbostel et al. (“Hornbostel”). On Sep. 11, 2008, the undersigned representative for the applicants called the examiner and discussed the office action by telephone. The applicants’ representative made the point that Hornbostel, as well as much of the other art that has been identified in connection with this examination, describes the conventional two electrode layout, one positive polarity and the other negative polarity, and both electrodes are depicted as straight in shape. (Hornbostel’s negative electrode is **142** and his positive electrode is **143** in his Fig. 14.) A single electrode cannot be “a plurality of [items of conducting material] connected by electrical conductor to each other” nor can a straight electrode be a single item of conducting material that “is configured to define a region [such as is defined by electrode **51** in the applicants’ Fig. 5], thereby providing an area of low surface noise for survey receiver placement.” (Quotes are from claim 1 of the present application.) The applicants’ representative drew attention to paragraph 5 of the application, where a similar observation is made about the known art. It was discussed that the physics principle being applied in the applicants’ invention is called the *Faraday cage* in physics textbooks. It was further discussed that one or plurality of “item[s] of conducting material” could be one or multiple electrodes of the same polarity (as illustrated in many of the drawings), or they could be connected conductors not connected to either + or – electrode (as described in paragraph 35 of the application).

The examiner understood the arguments being made, but pointed out three other prior art references that have come up in the search, where multiple electrodes of the same polarity have been proposed for use in geophysical prospecting. The applicants discuss these three references next. It should be kept in mind that the applicants’ claim 1 is not as broad as all geophysical prospecting. It is limited to an “electroseismic survey” which means that electrical energy is transmitted into the ground, where certain natural physical mechanisms convert it to acoustic (seismic) energy, which is then detected by survey receivers that are necessarily seismic receivers and cannot be electrical or electromagnetic receivers.

US 2,054,067 to Blau et al.

Blau does not disclose conversion of electrical energy to acoustic energy or even the reverse conversion (“seismoelectric”). Blau uses both a seismic source **1** (referring to Blau’s Fig. 1) and a source of electrical power **14** that sends electrical energy into the ground through multiple positive electrodes **9** and **10** and then collects the current with negative electrodes **3** and **4**. The reason for the seismic source is that the seismic shock changes the subsurface electrical resistivity (4th col., line 60) which causes a voltage change that can be detected at **19**, which Blau believes is somehow revealing of exploration indications. Blau’s seismic shock does not convert electrical energy to acoustic energy. The electrical energy remains electrical in form, and is collected as such, and not by seismic receivers as must be used for electroseismic prospecting. Furthermore, and in any event, Blau’s electrodes do not “define a region” in which “an area of low surface noise [is provided] for survey receiver placement.” To see this, consider the pair of electrically wired together electrodes **3** and **4**, Blau’s negative electrodes. They could be considered to define a region only in the limiting 1D sense (which is inconsistent with general meaning, with all examples in the present application, and with the phrase “an area of low surface noise” in claim 1), but this cannot even be a line of “low [electroseismic] surface noise” because that condition requires minimal electric fields, whereas locating a positive electrode **9** squarely in the middle of the region destroys that possibility and instead turns the line between electrodes **3** and **4** into a “region” of maximum electric fields. Moreover, Blau locates no seismic receivers there, and in fact seismic receivers play no part in his inventive method.

US 2,172,778 to Taylor

Taylor discloses a purely electrical method involving no seismic source or receivers. Like Blau, Taylor’s method is not about electroseismic surveying or reducing noise in such surveys, and hence the applicants’ claim 1 cannot read on either reference for that reason alone. Taylor’s Fig. 3 shows a two-conductor electrode, a central conductor and an annular outer conductor, separated by insulating material **22**. When such an electrode is hooked up to a circuit as shown in Fig. 1, each of the two conductors will be at the same electrical potential (voltage), at least when the switch **9** is closed.

Thus, though not taught by Taylor, as a matter of physics, the annular region **22** in Fig. 3 will be a region of low electric field. But this region is suggested by the drawings to be tiny, and no receiver of any kind is indicated as being located there. Further, seismic receivers play no part whatever in Taylor's method.

US 3,659,192 to Ryss et al.

This patent seems to be about detecting and identifying a mineral body by measuring the contact voltage difference across the interface between the ore and the surrounding rock. Like both Blau and Taylor, seismic detectors and conversions of electrical energy to seismic energy play no part in Ryss. Nothing is taught to reduce noise from near surface conversions of electromagnetic to seismic energy. In particular, nothing is taught about creating regions of low electric field near the surface so that survey receivers may be placed there. The closest connection that can be made between Ryss and the applicants' claim 1 is that Ryss's "current-carrying" electrodes **3** and **4** are each depicted as four separate stakes driven vertically into the ground, each of the four stakes wired to each other. This arrangement defines half of the negative electrode arrangement shown in the applicants' Fig. 3. Missing is the second row of electrode stakes **32** required to make a 2D area **34** where receivers may be located in a low electric field environment. The linear arrangement of Ryss's stakes does not define a region where near-surface electric fields are substantially minimized, to paraphrase the applicants' claim 1 (which is not what Ryss is teaching to achieve in any event). Moreover, Ryss does not indicate location of any sort of receiver between the stakes of electrode **3** or **4**. Even if "non-polarizing potential electrode" **12** is considered together with electrode **3** (even though not connected by wire), still no receiver placement is indicated along the line between **3** and **12**.